



LR-N16-0161

10 CFR 50.73

August 29, 2016

U.S. Nuclear Regulatory Commission  
ATTN: Document Control Desk  
Washington, DC 20555-0001

Salem Nuclear Generating Station Unit 2  
Renewed Facility Operating License No. DPR-75  
NRC Docket No. 50-311

SUBJECT: LER 311/2016-005-000  
Automatic Reactor Trip due to Main Generator Protection Trip

Licensee Event Report, "Automatic Reactor Trip due to Main Generator Protection Trip" is being submitted pursuant to 10 CFR 50.73 (a)(2)(iv)(A), "Any event or condition that resulted in manual or automatic actuation of any of the systems listed in paragraph (a)(2)(iv)(B)."

Should you have any questions or comments regarding the submittal, please contact Mr. Thomas Cachaza of Regulatory Affairs at 856-339-5038.

There are no regulatory commitments contained in this letter.

Sincerely,


  
F. Kenneth Grover  
Salem Plant Manager

tjc

Enclosure – LER 311/2016-005-000

Page 2  
LR-N16-0161

cc     D. Dorman, Administrator – Region 1  
       C. Parker, Licensing Project Manager – Salem  
       P. Finney, USNRC Senior Resident Inspector – Salem  
       P. Mulligan, Manager, IV, Bureau of Nuclear Engineering  
       T. Cachaza, Salem Commitment Coordinator  
       L. Marabella, Corporate Commitment Coordinator

<b>NRC FORM 366</b> (02-2014)		<b>U.S. NUCLEAR REGULATORY COMMISSION</b>		<b>APPROVED BY OMB: NO. 3150-0104</b>		<b>EXPIRES: 01/31/2017</b>				
		<b>LICENSEE EVENT REPORT (LER)</b> (See Page 2 for required number of digits/characters for each block)								
<b>1. FACILITY NAME</b> Salem Generating Station – Unit 2					<b>2. DOCKET NUMBER</b> 05000311		<b>3. PAGE</b> 1 OF 4			
<b>4. TITLE</b> Automatic Reactor Trip due to Main Generator Protection Trip										
<b>5. EVENT DATE</b>			<b>6. LER NUMBER</b>			<b>7. REPORT DATE</b>				
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO.	MONTH	DAY	YEAR		
06	28	2016	2016	005	000	08	29	2016		
			<b>8. OTHER FACILITIES INVOLVED</b>							
			FACILITY NAME DOCKET NUMBER <b>05000</b>							
			FACILITY NAME DOCKET NUMBER <b>05000</b>							
<b>9. OPERATING MODE</b>			<b>11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check all that apply)</b>							
Mode 1			<input type="checkbox"/> 20.2201(b)		<input type="checkbox"/> 20.2203(a)(3)(i)		<input type="checkbox"/> 50.73(a)(2)(i)(C)		<input type="checkbox"/> 50.73(a)(2)(vii)	
			<input type="checkbox"/> 20.2201(d)		<input type="checkbox"/> 20.2203(a)(3)(ii)		<input type="checkbox"/> 50.73(a)(2)(ii)(A)		<input type="checkbox"/> 50.73(a)(2)(viii)(A)	
			<input type="checkbox"/> 20.2203(a)(1)		<input type="checkbox"/> 20.2203(a)(4)		<input type="checkbox"/> 50.73(a)(2)(ii)(B)		<input type="checkbox"/> 50.73(a)(2)(viii)(B)	
			<input type="checkbox"/> 20.2203(a)(2)(i)		<input type="checkbox"/> 50.36(c)(1)(i)(A)		<input type="checkbox"/> 50.73(a)(2)(iii)		<input type="checkbox"/> 50.73(a)(2)(ix)(A)	
10. POWER LEVEL  100%			<input type="checkbox"/> 20.2203(a)(2)(ii)		<input type="checkbox"/> 50.36(c)(1)(ii)(A)		<input checked="" type="checkbox"/> 50.73(a)(2)(iv)(A)		<input type="checkbox"/> 50.73(a)(2)(x)	
			<input type="checkbox"/> 20.2203(a)(2)(iii)		<input type="checkbox"/> 50.36(c)(2)		<input type="checkbox"/> 50.73(a)(2)(v)(A)		<input type="checkbox"/> 73.71(a)(4)	
			<input type="checkbox"/> 20.2203(a)(2)(iv)		<input type="checkbox"/> 50.46(a)(3)(ii)		<input type="checkbox"/> 50.73(a)(2)(v)(B)		<input type="checkbox"/> 73.71(a)(5)	
			<input type="checkbox"/> 20.2203(a)(2)(v)		<input type="checkbox"/> 50.73(a)(2)(i)(A)		<input type="checkbox"/> 50.73(a)(2)(v)(C)		<input type="checkbox"/> OTHER	
			<input type="checkbox"/> 20.2203(a)(2)(vi)		<input type="checkbox"/> 50.73(a)(2)(i)(B)		<input type="checkbox"/> 50.73(a)(2)(v)(D)		Specify in Abstract below or in NRC Form 366A	
<b>12. LICENSEE CONTACT FOR THIS LER</b>										
<b>LICENSEE CONTACT</b> Thomas J. Cachaza, Senior Regulatory Compliance Engineer							<b>TELEPHONE NUMBER (Include Area Code)</b> 856 - 339 - 5038			
<b>13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT</b>										
CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX	
X	EL	XFMR	A500	Y						
<b>14. SUPPLEMENTAL REPORT EXPECTED</b>						<b>15. EXPECTED SUBMISSION DATE</b>		MONTH	DAY	YEAR
<input type="checkbox"/> YES (If yes, complete 15. EXPECTED SUBMISSION DATE)						<input checked="" type="checkbox"/> NO				
<b>ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)</b>										
<p>On 6/28/16 at 04:22 Salem Unit 2 automatically tripped from 100% power on Generator Protection. The reactor trip was initiated due to a Main Turbine (MT) trip caused by a Main Generator Protection signal. All emergency core cooling systems and emergency safeguards feature systems functioned as expected. The motor driven and steam driven auxiliary feedwater pumps started as expected on steam generator low level. Operators stabilized the plant in Mode 3 with decay heat removal via the main steam dump valves and auxiliary feedwater system.</p> <p>Investigation identified that a broken current transformer core ground wire internal to the A Main Power Transformer (MPT) was intermittently touching the X1 and X2 low voltage connections inside the transformer bushing compartment causing a ground fault. This caused the turbine generator trip.</p> <p>This report is being made in accordance with 10CFR50.73 (a)(2)(iv)(A), "Any event or condition that resulted in manual or automatic actuation of any of the systems listed in paragraph (a)(2)(iv)(B)," for this event actuation of the Reactor Protection System (RPS) and the Auxiliary Feedwater System (AF).</p>										

**LICENSEE EVENT REPORT (LER)  
CONTINUATION SHEET**

Estimated burden per response to comply with this mandatory collection request: 80 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the FOIA, Privacy and Information Collections Branch (T-5 F53), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to [Infocollects.Resource@nrc.gov](mailto:Infocollects.Resource@nrc.gov), and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
Salem Generating Station – Unit 2	05000311	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	2 OF 4
		2016	- 005	- 000	

**NARRATIVE****PLANT AND SYSTEM IDENTIFICATION**

Westinghouse-Pressurized Water Reactor {PWR/4}

Main Generator System/Transformer {EL/XFMR}

\*Energy Industry Identification System (EIIIS) codes and component function identifier codes appear as {SS/CCC}.

**IDENTIFICATION OF OCCURRENCE**

Event Date: 06/28/2016

Discovery Date: 06/28/2016

**CONDITIONS PRIOR TO OCCURRENCE**

Salem Unit 2 was in Mode 1 at 100 percent rated thermal power (RTP).

**DESCRIPTION OF OCCURRENCE**

On 6/28/16 at 04:22 Salem Unit 2 automatically tripped from 100% power on Generator Protection. The reactor trip was initiated due to a Main Turbine (MT) trip caused by a Main Generator Protection signal. All emergency core cooling systems and emergency safeguards feature systems functioned as expected. The motor driven and steam driven auxiliary feedwater pumps started as expected on steam generator low level. Operators stabilized the plant in Mode 3 with decay heat removal via the main steam dump valves and auxiliary feedwater system.

Investigation identified that a broken current transformer core ground wire internal to the A Main Power Transformer (MPT) was intermittently touching the X1 and X2 low voltage connections inside the transformer bushing compartment causing a ground fault. This caused the turbine generator trip.

This report is being made in accordance with 10CFR50.73 (a)(2)(iv)(A), "Any event or condition that resulted in manual or automatic actuation of any of the systems listed in paragraph (a)(2)(iv)(B)," for this event actuation of the Reactor Protection System (RPS) and the Auxiliary Feedwater System (AF). Notification of this event was provided via ENS report 52048.

**LICENSEE EVENT REPORT (LER)  
CONTINUATION SHEET**

Estimated burden per response to comply with this mandatory collection request: 80 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the FOIA, Privacy and Information Collections Branch (T-5 F53), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to [Infocollects.Resource@nrc.gov](mailto:Infocollects.Resource@nrc.gov), and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

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Salem Generating Station – Unit 2		05000311		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	3 OF 4
				2016	- 005	- 000	

**CAUSE OF EVENT**

The direct cause for Salem Unit 2 turbine generator trip was an intermittent ground fault caused by a broken Current Transformer (CT) core ground wire that was intermittently touching the low voltage connections inside the transformer bushing compartment.

The exact cause for the broken wire has not yet been determined yet. A Root Cause Evaluation is currently in progress. The preliminary report found that the CT wires were not secured to the transformer tank as expected.

**SAFETY CONSEQUENCES AND IMPLICATIONS**

There were no safety consequences as a result of this event. Operators appropriately responded to the reactor trip to stabilize the plant. All emergency core cooling systems and emergency safeguards feature systems functioned as expected. The motor driven and steam driven auxiliary feedwater pumps started as expected on steam generator low level. Operators stabilized the plant in Mode 3 with decay heat removal via the main steam dump valves and auxiliary feedwater system. Condenser vacuum remained available for the duration of the event.

**SAFETY SYSTEM FUNCTIONAL FAILURE**

This condition did not result in a safety system functional failure as defined in NEI 99-02, Regulatory Assessment Performance Indicator Guidelines.

**PREVIOUS EVENTS**

A review of previous events for the past three years identified two similar events. License Event Report (LER) 272/2014-003-00, Reactor Trip Due to Actuation of Generator Protection was issued on June 4, 2014. License Event Report (LER) 272/2014-004-00, Reactor Trip Due to Actuation of Generator Protection was issued on July 3, 2014. Both event were due to a failed wiring termination on the C Phase neutral generator current transformer. The corrective actions taken for those events were specific to them and would not have prevented this event.

**CORRECTIVE ACTIONS**

1. The broken CT wire on the A MPT was repaired.
2. The B and C MPT's were electrically tested with no anomalies noted.



**LICENSEE EVENT REPORT (LER)  
CONTINUATION SHEET**

to industry. Send comments regarding burden estimate to the FOIA, Privacy and Information Collections Branch (T-5 F53), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to [Infocollects.Resource@nrc.gov](mailto:Infocollects.Resource@nrc.gov), and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

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Salem Generating Station – Unit 2	05000311	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	4 OF 4
		2016	- 005	- 000	

**CORRECTIVE ACTIONS (cont'd)**

3. Additional corrective actions may be taken as appropriate at the conclusion of the root cause investigation.

**COMMITMENTS**

There are no regulatory commitments contained in this LER.